THE FOUR WONDERS

COTTON, WOOL, LINEN, SILK

ELNORA E. SHILLIG

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THE FOUR WONDERS

THE COTTON PLANT

THE FOUR WONDERS

Cotton - Wool - Linen - Silk

By
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Drawings by
CHARLES COPELAND

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A FOREWORD

THE exercises in this little volume are the products of schoolroom lessons given in a primary school in the development of studies upon our great textiles.

The purpose of the book is not only to furnish reading lessons providing information as to the four industrial wonders treated but also to present a method of subject planning in its developed form.

FRANK B. COOPER

City Superintendent of Schools
Seattle, Wash.

Courtesy of the Field Museum

SOME MEN WEAR SKINS AND FURS

CLOTHES

What beautiful dresses the birds wear!
What warm coats the animals wear!
Their coats grow on them.
Men must find their clothes.
Some men wear skins and furs.
They need very warm clothes.
Furs keep the cold out.
Do you know where these men live?

Some wear clothes made of grasses.
Do you know where they live?

WHEN IT STORMS THE JAPANESE WEAR COATS MADE OF GRASSES

Our clothes are not made of skins or of grasses.
Of what are they made?
Read these stories and you will know.

COTTON

A FIELD OF COTTON

WE CAN PULL THE FIBERS APART

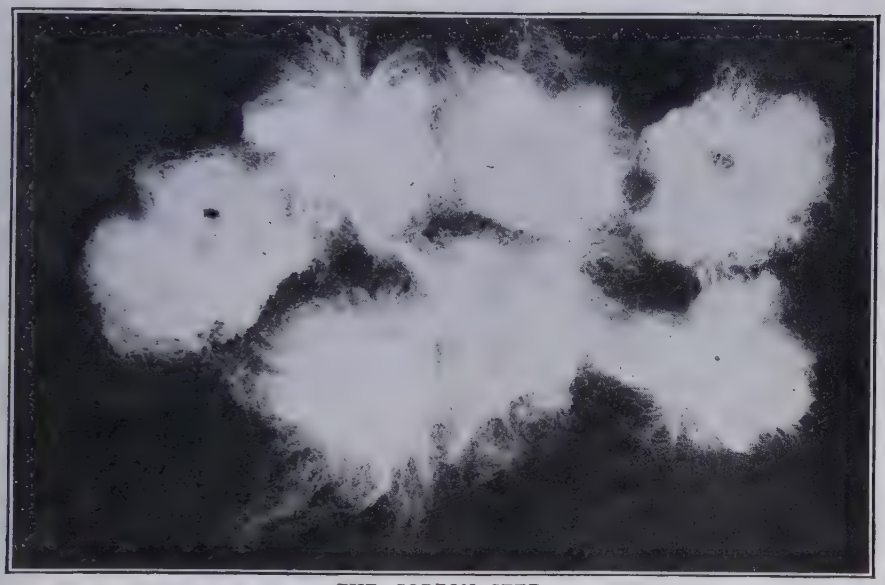
THE COTTON FIBER

We have cotton in our hands.
It feels soft and fluffy.
We can pull the fibers apart.
We can blow the fibers away.
They look like thistledown.
Mine floats like a dandelion fairy.
I can blow it away as I can a soap bubble.

We can twist the fibers into thread.
See, Harold has made a long thread.
Nellie's thread is so strong she cannot pull it apart.
The thread is coarse and very rough.
We cannot make a fine, smooth thread of coarse, rough fiber.

THE COTTON SEED

I feel something hard in the cotton.
I will pull it apart and see what it is.
How hard it is to pull apart!
Oh, they are seeds.
And how they do love their mother!
They cling very close to her.
The cotton must keep them very warm.
It makes a snowy blanket for them.
In the fall the seeds can fly away.
The cotton will be their wings.
Cotton grows out of its seed as wool grows out of a sheep's skin.



THE COTTON SEED

Cotton does not grow in the cold North.
Cotton grows where it is warm.
It is warm in the South.
Men plant the seeds in rows in the springtime.
The April rains keep them moist and the sunbeams keep them warm.
Soon little cotton plants come peeping up.
The rains make them grow fast and the sun makes them grow strong.

THE COTTON PLANT

The cotton stalk is like a bush.
It grows about four feet high.
The leaves are dark green.
When the plants are in bloom the cotton field looks like a field of roses.
But a single flower looks like a hollyhock blossom.
The cotton is a cousin to the hollyhock.
The color of the flower changes as the days go by.
The first day the blossom is light yellow.
The next day it is pink or red.
The third day the blossom drops off.
A little seed pod takes its place.
People call the seed pod a cotton boll.
The bushes are full of green bolls.
The bolls are full of cotton.
They will grow all summer.
Each boll has three sides.
By and by it will become brown and hard.

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COTTON BOLLS

THE FIELD OF COTTON

Autumn has come at last.
See the fields of cotton!
The bolls have burst open.
The cotton is fluffy and white as snow.
The whole field is full of snowballs.
I'm afraid the cotton will fly away.
Oh, no, the men will not let it fly away.

The negroes will pick it and put it into big baskets or bags.
When the baskets are full they carry them on their heads to the wagons.
The women wear bright-colored bonnets.
The bonnets make bright spots in the white field.

TAKING SEEDS FROM THE COTTON

Little children climb into the wagon and sink into the cotton till you cannot see them.
When they get out they look like big bunches of cotton.
The negroes take the cotton to the gin house.
There the gin separates the seeds from the fiber.
The gin is a big machine.
It takes the seeds out of the cotton very quickly.

PICKING OUT THE COTTON SEEDS BY HAND

It used to take one negro a whole day to pick the seeds out of one pound of cotton.

The seeds are not picked out by hand any more.

The gin takes them out.

BALES OF COTTON READY FOR THE FACTORY

BALES

After the seeds are taken out the cotton is very loose.

It must be pressed hard and put into bales before it is sent away.

These bales are covered with coarse cloth.

Light steel bands are put around them.

In the cities we find great factories with tall chimneys.

Big wagons take the bales of cotton to these factories.

WHAT WE SEE IN THE FACTORIES

Let us peep inside a factory and see what the machines are doing.

In one we see a roller whirling round and round, pulling the cotton to pieces.

Another machine takes it up.

Out comes the cotton in sheets, looking like a huge drift of snow.

The tangled fibers are combed until they all lie one way.

Then they come out in a soft rope of cotton yarn.

Another machine spins these soft ropes into long, fine threads.

These threads are taken to the weaving room.

GETTING THE THREADS READY FOR THE WEAVING ROOM

There shuttles fly back and forth, back and forth.

They fly so fast we almost think they are alive.

The busy looms weave many hundred yards of cloth in one day.

Some of the cloth is left white.

Some is colored many beautiful colors for calico, gingham, and many other kinds of cloth.
Most of the cloth is sold to the people in our own country.
Some of it goes across the ocean to China and Japan.
How many things can you name that are made of cotton?
What do you wear that is made of cotton?
What time of the year do you wear cotton clothing?

ELI WHITNEY

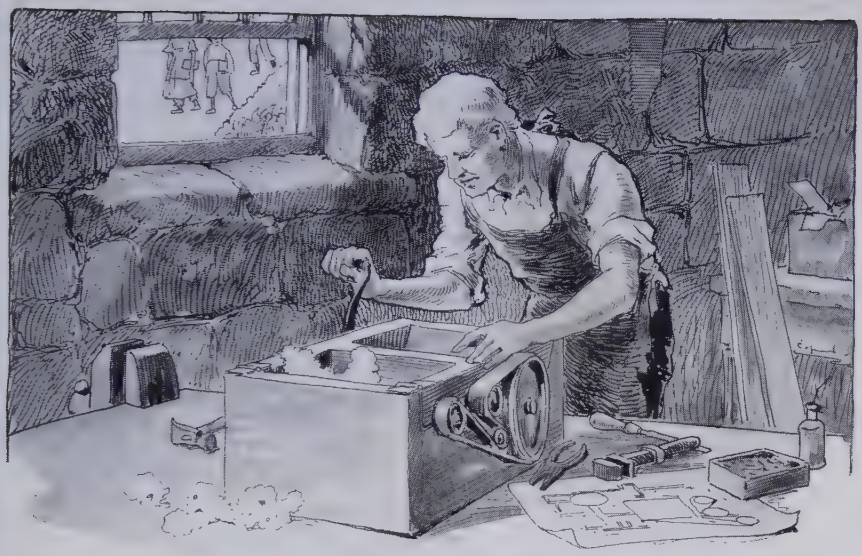
Eli Whitney was a poor boy.
He lived on a farm in Massachusetts.
He went to the country school.
Eli worked on the farm, too.
He took care of the cattle and horses.
Eli's father had a workshop on his farm.
Eli loved to work in this shop.

ON RAINY DAYS ELI WORKED IN HIS FATHER'S SHOP

He loved to work with his father's tools.
He made many useful things.
He made knives, and tables, and chairs.
These things he made on rainy days.
Once Eli made a fiddle.
He could play tunes on it.
People said it was a very good fiddle for a boy to make.
They brought him their violins to mend.
He did good work on them.

Every one was pleased and surprised.
When he was fifteen years old he made nails and sold them.
His father had a big silver watch.
Eli thought it was a great wonder.
How could it keep up that "tick, tick" and never get tired?
What made one hand move slowly and the other fast?
One Sunday when Mr. Whitney went to church he left his watch at home.
Eli thought, "Now is my chance. I must see what is inside it."
He hastened to the room where the watch was.
He trembled with fear, but he could not let it alone.
When he got it open he looked at it a long time.
He forgot everything but the watch.
It seemed to be alive.
He did not think even of his father.

He took it all apart.
Then he began to be afraid.
How could he put it together again?
How angry his father would be!
But he had studied the watch so well that he knew just where each screw belonged.
And at last it was all together again.
His heart leaped with joy when he heard the "tick, tick" once more.
The watch was put together so well that it was not hurt.
Years afterward he told his father about what he had done.
When Eli was a young man he went to Georgia.
Men in the South wanted a machine that would take the seeds out of the cotton.
Eli Whitney thought he would try to make one.
He set to work in Mrs. Green's basement.
The children going to and from school heard a queer noise.



ELI WHITNEY AT WORK ON THE COTTON GIN

It said, "Clink, clank! Tinker, tanker!"
The children thought it so funny it made them laugh.
Young Whitney did not mind their laughing.
He worked hard for many days, and at last the cotton gin was finished.
The gin would take out more seeds in a day than a man could take out in months.

THE COTTON GIN IN USE

The Southern people were delighted with the gin.
They bought more slaves.
They planted more cotton seed.
They made larger and larger plantations.
The gin made the South a very busy country.

LITTLE MISSY

MISSY AND THE LITTLE GREEN MEN

Little Missy wandered away from home.
She was a long way from the plantation house.
She heard the colored people laughing and singing in the cotton fields
She followed them.
She saw Dinah's red turban bobbing among the cotton plants.
Missy looked at her dainty white dress.

It was quite soiled.
She wished she had a dress the color of Dinah's turban.
She was close to the men and women.
If they saw her, Dinah would take her back to her mother.
Little Missy wanted to watch them work.
"I will sit in the shade of these plants. Then I can see," she thought.
"Why do the colored people pick that pretty fleece?"
The sun became very warm.
Little Missy thought she would lie down a while.
She looked through the leaves into the sky.
A butterfly floated over her head, but she did not see it.
A bumblebee buzzed quite near, but she did not hear it.
She was thinking about the color of Dinah's turban.

Where did she get that beautiful red cloth?
What a lovely dress it would make!
Soon Missy felt sleepy and closed her eyes.
"Dear me!" said a voice like a silver bell.
"Dear me! How you frighten one!
"I nearly slid off this leaf.
"What are you making such a noise about?"
Little Missy opened her eyes very wide, indeed.
She saw a tiny lady standing on a cotton leaf.
The lady was not much taller than Missy's longest finger.
She had wonderful green hair!
A sky-blue dress floated around her.
She had gauzy wings of shimmering rainbow colors.
She carried a golden wand in her hand.
Missy quite forgot her manners, and stared and stared at her.

"I AM THE QUEEN OF THE COTTON FAIRIES"

"Don't you think you might be more polite?" said the little lady.

"I am the queen of the cotton fairies.

"How do you like me?"

"I like you very much indeed," said Missy. "Hop on to my hand, please."

"No, thank you," said the fairy, laughing merrily.

"I never hop.

"I float or fly or dance, and I never leave my pretty plants.

"All summer I swing in the white and yellow and pink blossoms.

"I sip their honey and taste their dew.

"I dance on the broad green leaves.

"When the flowers are gone, I go to sleep in one of these little brown cradles you call bolls.

"See what nice soft white blankets I have.

"There are little brown seed babies wrapped up in these fleecy blankets, too."

"Are there?" asked Missy, much surprised.

"Yes," said the fairy.

"They grow and grow till the cradles burst open.

"Then out puffs all this pretty white fleece.

"Out I come, too.

"I shake my skirts and wings like a new butterfly.

"Then I am ready for work."

"Ready for work!" exclaimed Little Missy.

"Yes, for work, which is to give good little girls what they wish."

"Oh, I wish I had a pretty red dress like Dinah's turban."

"Be good, and you will get your red dress."

Then the fairy queen clapped her tiny hands.

"What! ho! my men, my merry green men!" she cried. "Come, come!"

There was a pat, pat, pattering of little feet.

Around the fairy queen Missy saw a band of tiny green men.

Each carried a basket almost as large as himself.

They bowed low to the queen.

"TO WORK, MY MERRY MEN!"

She waved her wand again and cried, "To work, my merry men! The cotton is ready."

The little men climbed nimbly over the cotton plants.

They picked the cotton and put it into their baskets.

One little man held some cotton in his hand, and said, "Here is a seed baby wrapped in its blanket.

"If you will not hurt it, I will let it fly to you.

"There, can you catch it?"

Missy held up her hands and caught the little brown seed.

She looked at it carefully.

"That's right," said the little green man. "Now come with me."

Missy looked at the queen, who said, "Yes, go. He will take care of you.

"I never leave my pretty plants."

"Come on, Missy, we are going to the gin," he called.

"To the what?" gasped Missy.

Then she found herself running very fast behind the little green man.

"To the gin, where they take out all the seeds. Hurry!"

Soon she was watching the brown seeds picked out by a machine.

Then the dirt and leaves were taken out of the cotton.

In another place the fibers were carded and laid straight.

THE MILL WITH ITS TALL CHIMNEYS IS A BUSY PLACE

"Now away to the mill!" shouted the little round-faced man.

They ran so fast Missy could hardly keep up.

Soon they came to the busy mill on the bank of the river.

It was all noise and wheels and swift-moving bands.

Here she saw the cotton pulled this way and that.

It was drawn into threads.

These threads were crossed many times in the loom.

At last out came yards of creamy cloth.

"Away to the dye room!" shouted the little green fellow again.

"Now, what color shall it be, Little Missy?"

"Oh, red, please," replied Missy, "red like Dinah's turban."

Soon the little green men were waving in the air a piece of beautiful red cloth.

"I MUS' TAKE YO' BACK TO DE HOUSE"

"Take it, it is for your dress," they said.
Missy lifted her hands to catch the cloth.
She opened her eyes and saw Dinah's turban.
Dinah's kind face was bending over her.
"My little Missy," she said, "how did you get heah?
"I mus' take yo' back to de house."

"But, Dinah, where is the fairy queen?
"She was on that leaf.
"And where are the little green men, Dinah, and the beautiful red dress?"
"Bless the chile, she's been dreamin'. I spec' the fairy lady has gone to sleep in a cradle.
"Yo's been dreamin', little one."
"It was a nice dream, Dinah.
"Take me back to the house, please.
"I'll ask mother for a red dress.
"She'll be the fairy lady."

EMMA V. SHOUDY.

MAMMY'S NIGHT SONG

Gerard Tonning

Andante espressivo (*Rather slow*)

At close of day, the long hot day, When the

twi-light mists are fall - ing, The long a - go and the

far a - way To my heart are call - ing, call - ing;

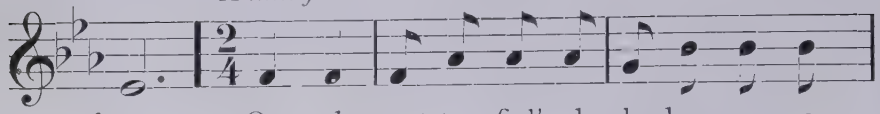
Call - ing a-cross the years, So ten-der and sweet and

true, . . My good old Mam - my is

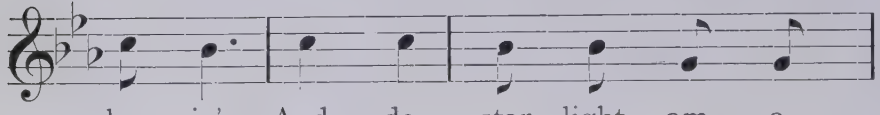
sing - ing to me, And this is the song I

MAMMY'S NIGHT SONG Concluded

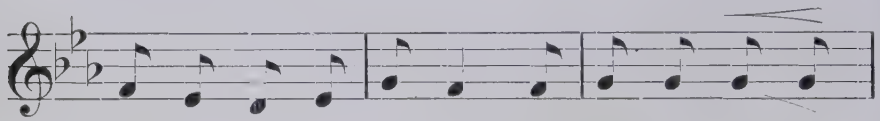
A little faster



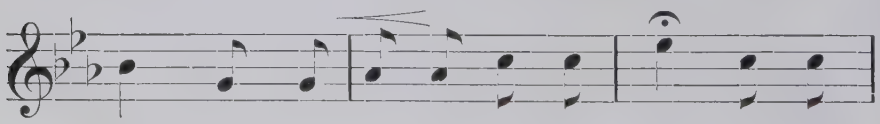
hear: On de cot-ton-fiel's de shadows am a-



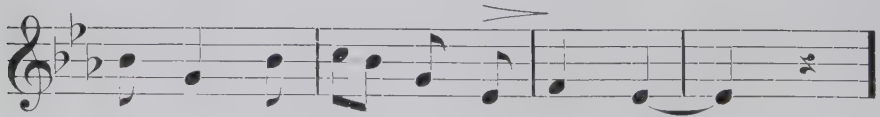
sleep - in', And de star - light am a -



dreamin' on de rib - bah, De shad-ows go a -

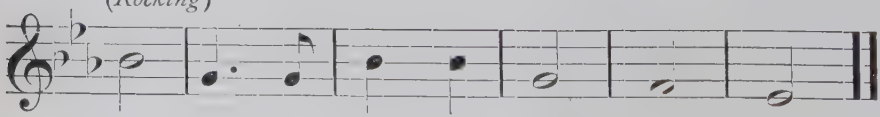


way, and de star-light neb-bah stay, But yo'



Mam-my she lub yo' for eb - bah. . .

(*Rocking*)



So sleep, my hon - ey child, oh, sleep.

WOOL

WEAVING A WOOLEN RUG

ON THE WAY TO THE PASTURE

THE WOOL FIBER

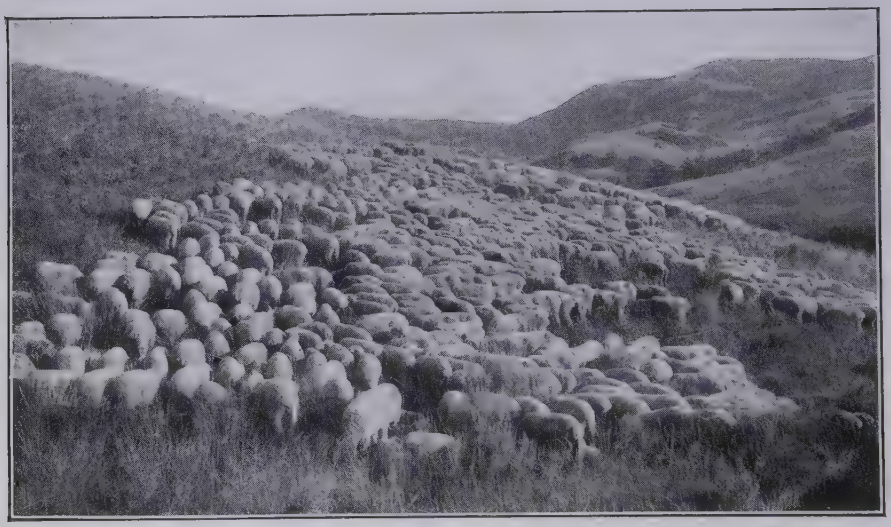
The sheep give wool to keep us warm.
Ann's dress is made of wool.
It feels rough, but it is soft and warm.
Her apron feels cool and smooth.
It is made of cotton.
Wool is warmer than cotton.
It will not let the heat of the body pass out.
A man sent us some wool.

He cut it from his sheep last spring.
We have it in school now.
It is stained and soiled.
It has oil in it.
The oil in the wool came from the sheep's body.
We washed some of the wool to make it soft and clean.
Now it is dry and fleecy and white.
But it is not so white as cotton.
We shall pull the fibers apart gently.
They are longer than the cotton fibers.
They curl more than the cotton.
Pull a fiber through your fingers.
You feel tiny notches on the fiber.
The notches are scales.
The scales make the fibers curl.
We have some cloth that is made of wool.
We washed it in warm water.
When the cloth was dry it was soft and clean.

Then we boiled the cloth.
The little scales made the fibers curl more and cling tighter together.
When it was dry the cloth was thicker and much smaller.
The hot water made it shrink.
Ann's mother washed her pretty dress.
Now it is so small Ann cannot wear it.
Can you tell why?

SHEEP IN THE WEST

Let us go far away into the mountains—the mountains where the sun seems to set.
The train will take us there.
We shall stay in the mountains and let the train go on.
We see only the rocky hills and the blue sky.
But let us look more closely.
What is that we see in the distance?



DURING THE SUMMER THOUSANDS OF SHEEP FEED IN THE MOUNTAINS

A man? Yes, but what are all those queer moving things!

They are sheep.

There are thousands of them eating grass.

They will stray away if the herders do not watch them.

The herders have two good dogs to help them.

Let us go nearer to the sheep and watch them.

They have had a good drink from the river.
All day they have had plenty of grass to eat.
Now they are sleepy and wish to lie down.
The herders will bring them together for the night.
The sky will be their roof.
The good earth will be their bed.
Their soft, white wool will be their blankets.
They will sleep until morning.
There is no more grass in this place.
The sheep have eaten it all.
Long before the sun is up they must wake and travel on.
Large bands of sheep cannot stay long in one place.
They must go to a new place where there is grass and water.
A bell sheep is their leader.

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A HERDER AND HIS DOG

He is larger than the others.
The sheep hear the tinkle of his bell
and follow him.
They are sometimes very naughty.

They bound here and there, scrambling up the mountain side.
Higher and higher they go.
Their slender legs and toes are just right for climbing among the rocks.
But the dogs will outrun them and bring them back.
The herders must have been angry with them and must have scolded them for their naughty ways.
Do you know why sheep like the rocks and the hills?
It is because their great-great-great-grandparents were wild and lived in rocky hills.
The sheep have traveled all day, but have found neither grass nor water.
They are tired, and hungry, and thirsty.
But now they are on the other side of the mountain.
All at once they rush forward, some of them running like deer.

Are wolves after them, or bears?
Ah, no!
Then what do they see?
Beautiful green hills!
And there, just a little farther, is the broad, shining river.
They will soon reach it.
But it runs too swiftly, and they are afraid.
They dash here and there, tumbling over one another.
When they have found a quiet place in the river they drink and drink.
The fresh green grass, too, makes them feel happy.
They dance, and bound in the air.
Some come down sideways, kicking up their heels.
Some knock each other with their hard foreheads.
To-night they are content and willing to sleep.

There they are, a solid mass of woolly heads and backs.
The herders and dogs will sleep, too, for they are very tired.
So the summer wears away, the herders tell us.
When fall comes a chill breeze begins to blow.
The hillsides become brown, and dry, and bare.
The grass is all gone, and the frost takes the place of the sparkling dew.
Sheep are delicate and tender animals.
Their wool is not thick enough to keep them warm.
They cannot endure the cold as other animals can.
The herders bring them to shelter and put them into sheds.
In the springtime they will go into the hills again.
How glad they will be!

TAKING THE SHEEP TO SHELTER

SHEEP SHEARING

When the warm spring days come the old wool feels uncomfortable.
It begins to fall off.
The new wool begins to grow.
By summer time the coats are heavy and loose.
The sheep wish some one would take their coats off.
The whole flock is then brought together and put into pens.
There are many little lambs in the flock.
They are taken from their mothers and put into pens by themselves.
They bleat pitifully.
What does it all mean?
Will they never see their mothers again?
Strange men come into the shed.
They have queer looking shears in their hands.

The sheep are frightened, and huddle together.
One by one they are caught and taken into the shed.
At first they struggle to get away, but cannot do so.
Each man puts a sheep's head on his knee.
Then the sheep lie quite still.
The big shears say, "Snip, snip, snip!"
The fleece falls away from the sheep's bodies and makes them feel cool.
After the sheep are sheared they are turned into the meadow.
They look smaller and whiter.
They begin to frisk about.
They seem to be playing all sorts of lively games.
At last the gate is opened and the lambs are free.
But the little lambs do not know their mothers.

SHEARING THE SHEEP

And no mother can tell which is her baby.
So they all cry, "Baa! baa! baa!"
They go about touching each other with their noses.
When a mother smells her own little lamb how happy she is!

WHAT BECOMES OF THE WOOL

The men who sheared the sheep tied the fleece in large bundles.
These were sent to the mills in the big cities.
The sheep had been in the dust and mud, so the fleece was very dirty.
Then, too, it was full of oil from the sheep's bodies.
It must be cleaned.
All the fine wool was gathered into one pile and the coarse wool was put into another pile.

Then it was all put into tanks of boiling soapsuds.
Men stirred it with long sticks.
At last it was taken out and put through rollers to press the water out.
Large whirling fans helped to dry it.
Soon the wool was a great fluffy white heap.
Some of it was put into tanks of different colored dye.
Some of it was pure white.
All the wool was put through the carding machine and made into ropes, just as the cotton was.
Then the ropes were spun into yarn.

HOW CLOTH IS WOVEN

Did you ever weave a rug or a mat?
Did you notice the little girl in the picture weaving a rug?
The frame she is using is called a loom.

The thread placed in straight rows is called the warp.

The yarn that is woven back and forth between the threads is the woof.

Yards and yards of cloth are made in this way.

In the mills the cloth is made by big machines.

They make pretty, fine dress goods and blankets.

They weave strong cloth to make suits for men and boys.

Did you know there were knitting machines?

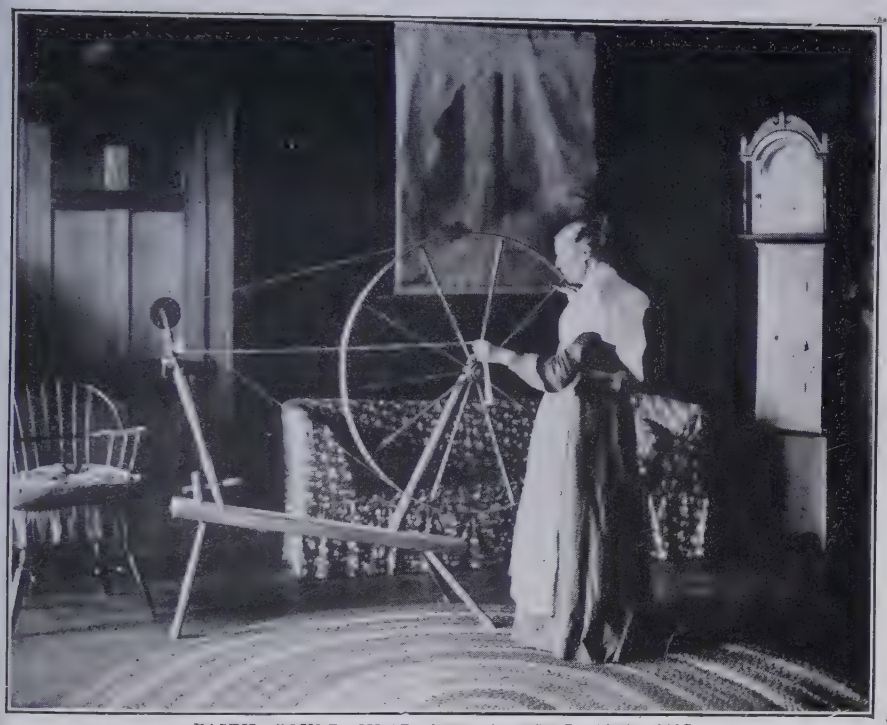
They knit your soft wool underwear, sweaters, mittens, and stockings.

Some wool was spun into coarse, hard yarn and made into beautiful carpets.

There are many woolen factories.

Some make blankets, some make underwear, and some make dress goods.

Other mills make carpets and rugs.



FAITH COULD HEAR HER MOTHER SPINNING

HOW FAITH GOT A NEW DRESS

Faith Goodman was a little Puritan girl. She lived many years ago in a small village.

One bright spring morning she was in the garden, making flower beds.

Through the open window she could hear her mother spinning.
"Whir, whir, whir!" went the wheel.
Her father came to her and said, "Faith, would you like to have a new dress?"
"Oh, yes, father! May I have one?"
"Then come and help shear the sheep," answered her father.
"They will give you one."
"Will the sheep give me a dress, father? How queer!"
"Yes, Faith, they will be glad to give it to you.
"Their wool is too warm for them to wear now.
"They were washed in the brook two days ago.
"Now their wool is dry and clean."
Faith ran to get some salt.
She put it on the ground.
Sheep like salt as well as children like candy.

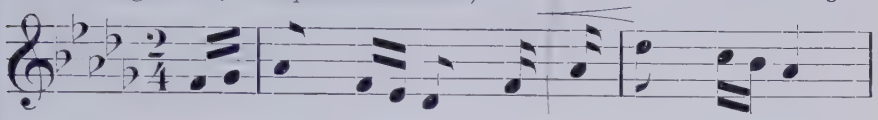
They ran quickly to get it.
Some men were helping Mr. Goodman.
Each caught a sheep and cut off the long wool.
Faith helped to pick out the burrs and dry grass.
She liked to toss the wool in the air.
"It looks like fleecy white clouds," she said.
"You must help me card it," said her mother.
"See, it is like using two combs."
The cards were blocks of wood with iron teeth in them.
The cards make long, soft rolls of the wool.
After a few days Faith's mother taught her how to spin the wool into thread.
Faith liked to hear the "whir" of the wheel.
She liked to watch the thread drawn out from the wool.
One day Faith's mother said, "You have spun enough yarn.

"We shall begin to weave it into cloth."
The loom was put up and the weaving began.
Back and forth, over and under, they wove the thread.
Soon they had a long piece of cloth.
"What color shall we dye it, Faith?" asked her mother.
"Oh, blue, please, a pretty blue."
When the cloth was dyed, Faith and her mother made the dress.
It had a long skirt and a short waist.
Little Puritan girls wore dresses made that way.
Faith was very happy in her new dress.
She was happy because she had helped to make it.
Her father was proud of his little girl.
He bought her a new spinning wheel.
Faith was so happy she sang a little song about it.

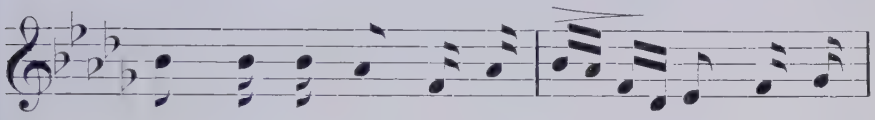
EMMA V. SHOUDY.

SPINNING SONG

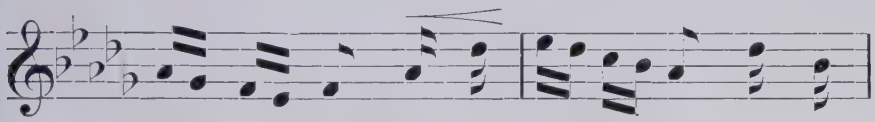
Allegretto (*With pleasant motion*) Gerard Tonning



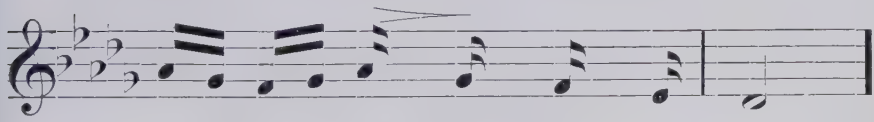
I spin and spin thro' the live - long day,



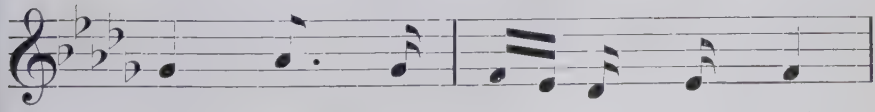
Un - der the trees in the mer-ry way. See the



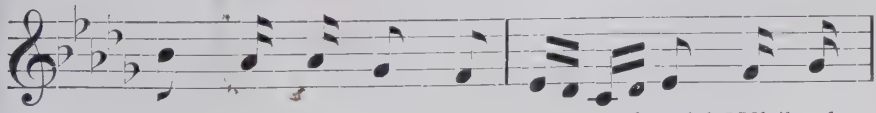
thread so fine from the soft wool come, As I



twist and twist it with my thumb.

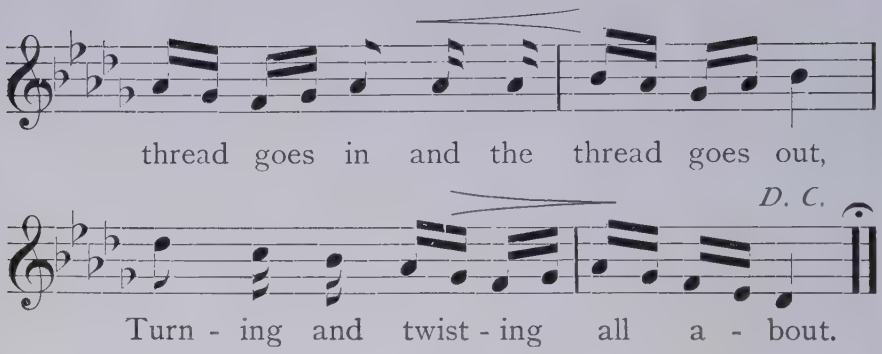


Whir, whir, a - whirl - ing and whirl,



Doub - le and turn and twist and twirl, While the

SPINNING SONG Concluded



THE SHEEP LIE DOWN AND WAIT FOR THE SHEPHERD TO DRAW THE WATER

THE SHEPHERD IN THE HOLY LAND

Can you think of a land far away—the land where Jesus was born?
There the hills are red and brown and yellow.
The plains are bare and dry.
Across these plains comes a shepherd.
He has a flock of a hundred sheep.

SHEPHERDS CARRYING THEIR SHEEP ACROSS THE JORDAN RIVER

He is leading the way, and the sheep are following close behind.
He is leading them to a well of good, fresh water.
There are few running streams in that land.
So the people have dug wells and put stones around them.
When the shepherd reaches the well he speaks to his sheep.
They lie down and wait for him to draw the water.
When he has drawn enough he calls to a part of the flock to drink.
Each part must take its turn.
He sometimes calls them by name.
They understand, for they know his voice.
They love their shepherd dearly, and they know that he loves them.
When he calls "Ta-a-a-ho-o-o!" the sheep hurry and cuddle close to him.
Now he will lead them to a place where the grass is green.

THE SHEPHERD BATHES THE BRUISED SHEEP WITH OIL

Sometimes he must lead them far away over rocky hills.

The shepherd carries a crook.

Sometimes the sheep wander into dangerous places.

Then he pulls them out with his crook.

At the end of the day the shepherd, with his flock, comes back to the fold.

He stands in the doorway to count the sheep as they pass in.

He has a horn of olive oil in his hand.

He will bathe a scratched side or a bruised knee with the oil.

Here comes a sheep that is tired and worn.

He will bathe its face, then give it a cool, fresh drink from his cup.

When he has finished counting, he finds that a little lamb is missing. He looks about. He does not see it.

He calls, but it does not come. He is tired, but he loves his little lamb dearly.

The shepherd cannot sleep until it is safe in the fold.

He closes the door, then back to the hills he must go,—back through the fields and up over the hills.

Behind the rocks he looks. He searches among thorns and briers.

The darkness is coming fast.

Quickly he strides over the rocks, now here, now there. Then he listens, then hurries on again.

Now he stands on the edge of a high rock.

He turns his face to the starry skies.
A prayer is in his heart.
On the still night air comes a faint sound, oh, so pitiful and plaintive and sad.
Quickly the shepherd is on his knees, straining his eyes to see into the gulch.
There on the side of the gulch is the dear little lamb.
It has fallen over the rocks and is caught in the branches of a tree.
The shepherd descends carefully, for he might fall.
But he does not think much about that.
His only thought is of his lamb.
On his way back to the fold he holds it tenderly to his breast.
The lamb cuddles close to him and seems to say, "I knew you would come."
The sheep in the fold have long been asleep.
The shepherd and his lamb will sleep there, too.

To-morrow they will wander away again. They will wander over the same paths that the shepherds did when Jesus lived there.

Just think how many years we have had clothing from the sheep!
Long before Jesus was born, shepherds cared for flocks.
Even kings kept flocks of sheep.
And all for the wool that grows on the sheep's backs.
The women spun the wool into yarn and wove it into cloth, then made it into clothes.
Cloth was made in this way for hundreds of years.
How busy the women were!
It is not two hundred years since wise men began to make machines.
How glad the busy mothers must have been to buy cloth already woven!

COLLIE

Here is a picture of a collie.
What a fine head he has!
How strong he looks!
Collies are sometimes called shepherd dogs.

They help to care for sheep in the mountains and on the plains.
They are wise dogs, and faithful to their masters.
They are kind and gentle with the sheep.
Sometimes the sheep become frightened and scatter far apart.
Then the good collie runs swiftly and brings them together again.
There may be wolves near the flock, but the dogs are strong and do not fear them.
The sheep feel safe when the dogs are with them.
Once a sheep herder was killed in the Western hills.
He had a large flock of sheep.
The collie seemed to know what had happened.
He knew that the sheep must be cared for.
He took them to the river for a drink every day.

Each day he found new pasture for them.
At night he kept faithful watch over them.
And so they lived through the long summer days.
One day some herders passed that way.
They found the dog alone with the sheep.
They took the dog and the sheep home and cared for them.
Perhaps you know other true stories about brave and faithful collie dogs.

LINEN

THE FLAX PLANT

OUR FLAX FIELD

Oh, mother, mother, come and see our flax field!
We planted the seed in April.
At first the plants looked like fresh grass blades.
But they grew and grew into these slender stalks.
Now our field is in full bloom.
The blossoms are as blue as the bright blue sky.
Last night they were only wee little buds.
This morning the sunbeams kissed the buds, and now they are open.
To-night they will fold their dainty blue petals.
The soft, warm breezes will lull them to sleep.
In the morning the wind will come to play with them.

Then they will wave and dance all day long.
After a few days a wind fairy will come and scatter all the petals far and wide.
Little round seed cradles will take their places.
The little seeds will soon be brown and ripe.

THE PLANT THAT GIVES US LINEN

We have some flax plants in our schoolroom.
They grew in our school garden last spring.
The stalks of the flax plants are straight and brown.
They are smooth and slender.
We can pull the fibers from the stalks.
We can separate them until they are as fine as cotton fibers.

WE LIKE TO PULL THE LONG FIBERS FROM THE STALK

Linen fibers are longer and stronger than cotton or wool fibers.

They do not curl.

We like to pull the long fibers from the stalk.

In the sunlight they look like silvery spider webs.

PHILIP IN HIS LINEN SUIT

PHILIP'S SUIT

Philip has a new white suit.
It is made of linen.
Linen is made from the flax plant.
It feels cool and smooth.
It feels cooler than cotton cloth.
It is much stronger than cotton cloth.
The cotton seed grew and gave us cotton.
The flax seed grew and gave us linen.
The flax seed is much smaller than the cotton seed.
It is brown, and smooth, and glossy.

HOW LINEN IS MADE FROM FLAX

Mr. Martin has a large field of flax.
One sunny day Mr. Martin said to his men, "We must pull the flax."
So the men went into the field and pulled the flax.
They tied it into small bundles.

IN THIS WAY THE SEED PODS ARE PULLED FROM THE FLAX STALKS

They were careful to keep the roots all at one end and even.

They spread a large sheet on the ground.

In the middle of the sheet they set a large comb with iron teeth.

Then the men drew the flax through the comb.

In this way the seed pods were pulled from the stalks.

The seeds fell upon the sheet.

Some of the seeds were sent away to market.

Some were kept for planting next year.

The men put the stalks into water and left them there until they were soaked through.

Then the fibers began to separate from the woody cores.

The stalks were now taken out of the water and laid in the warm sun to dry.

When they were dry they were hung up in a machine.

Here they were pounded and beaten until the woody cores broke entirely away from the fibers.

Then the fibers were sent to the linen mills.

There they were combed and combed.

This combing pulled all the fibers out straight.

Then they were put through another machine.

This machine split the fibers into finer ones.

SPREADING LINEN TO BLEACH ON THE GREEN AT BELFAST

And so they went from one machine to another.
At last the linen fibers were spun and woven into cloth.
Some of the cloth was bleached on the grass for white goods.
Some of it was dyed for colored goods.

Long ago the women spun the linen fibers and wove them into cloth.
Then they put the cloth out of doors to bleach.

They spread the long strips of cloth on the green grass.
Each day the rains and the warm sun made the strips whiter.
When the cloth was pure white the women cut it up and made things to use and to wear.
Name articles at home that are made of linen.
Name garments made of linen.

SILAS MARNER

Long ago a linen weaver lived in England.
His name was Silas Marner.
He lived alone in a little stone cottage.
There was a hedge around the cottage.
The strange noise of his loom was heard all day long.
The boys from the village stopped to peep in at the window.

They thought the weaver a very queer man.
They laughed at him and teased him.
But Silas Marner went on with his weaving.
He wove the flaxen thread into beautiful linen.
The women in the village bought the linen from him.
They paid him with gold.
He loved the gold very much.
He took up some bricks from the floor under his loom.
Here he made a hole and put the bags of money in it.
Then he put each brick back in its place.
Sometimes he would weave far into the night.
As he threw his shuttle back and forth he watched the pattern grow in the cloth.

Often when he became weary and tired he would take up the bricks in the floor and draw out the bags of money.

He loved to count the money over and over.

Then he would put it back again until the next night.

One evening he went to the village to buy some fine thread for his loom.

It was very late when he reached home.

He went to the hole to get his money.

It was not there.

He looked in every corner.

He looked in his bed, then in the oven.

At first he could not believe that any one had stolen it from him.

But when he could not find the money he knew that some one had come while he was gone and had taken it away.

Day after day he worked at his loom with a sad heart.

When night came he had no gold to count.
But one night a beautiful thing happened to him.
It was New Year's Eve.
A little baby girl toddled into his cottage.
She went up to the fire and held out her little hands to warm them.
Then she lay down on a coat before the fire and fell asleep.
The weaver did not see her come in.
When he stooped to stir the blazing logs he saw something yellow in front of the hearth.
He thought it was his gold come back to him.
He put out his hand to take it, but instead of gold, his fingers touched soft, yellow curls.
It was a little baby girl.
Where had she come from?

It seemed to him she must have flown in like a bird.
The child awoke and cried, "Mamma!"
Silas took her up in his arms.
He gave her some porridge sweetened with brown sugar.
She liked it, and did not cry any more.
No one claimed the baby, so Silas took her into his home, and kept her as his own little girl.
He called her Eppie.
Eppie grew like all other little girls.
She was not always good, and the weaver did not always have time to watch her.
One day when she was three years old he tied her to his loom with a broad strip of linen and then went to work.
Eppie saw the scissors near by and cut the strip that held her.
She toddled out of doors into the bright sunshine.
Silas worked a long time.

PIPPIE SAW THE SCISSORS NEAR BY AND CUT THE STRIP THAT HELD HER

When he turned around, Eppie was gone.

He was frightened, and hastened first here, then there, calling, "Eppie, Eppie!" but there was no answer.

He went through the meadow, and on into the next field.

There she sat by the side of a pond, talking to her tiny shoe, which she was filling with water.

Silas was so glad to find her that he could not scold her for running away.

Day after day Silas worked at his loom.

He was the best weaver in that part of the country.

The women bought all the cloth he could make.

As he wove he thought of his little girl.

He thought of the pretty things he would buy for her.

A good woman taught Silas how to care for Eppie.

This woman lived in the village.
Her name was Dolly.
As Eppie grew older Dolly taught her how to do many things.
Eppie was a happy child, and wanted to learn.
When she became a young lady she could prepare the meals.
She knew how to keep the cottage neat and clean.
One night a rich man came to the cottage.
He said that Eppie was his daughter.
He wanted to take her home with him.
The weaver did not wish to give her up.
But he was growing old and could not weave so much cloth as he used to.
He thought perhaps Eppie would be happier in a rich home.
He asked her if she would like to go.
Eppie clung to Silas and said she did not know any other father.

She said she did not care for fine things that Silas could not buy for her.
The rich man went away with a sad heart.
No one could part the weaver and the child that had come to him.
They were happy in their little home.
Near the cottage was a stone pit, full of water.
One day some men came and drained the water out.
What do you suppose they found?
They found some bags of gold!
It was Silas Marner's gold.
The man who stole the gold was found there, too.
He must have fallen into the pit the very night he stole the money.
But Silas did not care so much for the gold now.
He cared more for Eppie than for all the gold in the world.

BELFAST, THE LINEN CITY

Let us go across the Atlantic Ocean.
We shall come to a beautiful island.
It is called Ireland.
Our ship will land us at Belfast.
It is a very busy place.
It is the greatest linen city in the world.
All over the city we find linen factories.
Some of them look like great palaces.
Let us step inside the big doors.
All the rooms are full of people.
Every one is busily at work.
Not for himself alone, but for you and for me.
Perhaps your table linen at home was made here.
Here, too, is made the finest of lace, towels, and handkerchiefs.
In the country, around the city, are many lakes.
Green hills are everywhere.

In the valleys between the hills are the flax fields.
The people are proud of their flax.
They are proud of their linen, too.
We are glad they send it to us.
What can we send them in exchange for their linen?

FLAX IN EGYPT

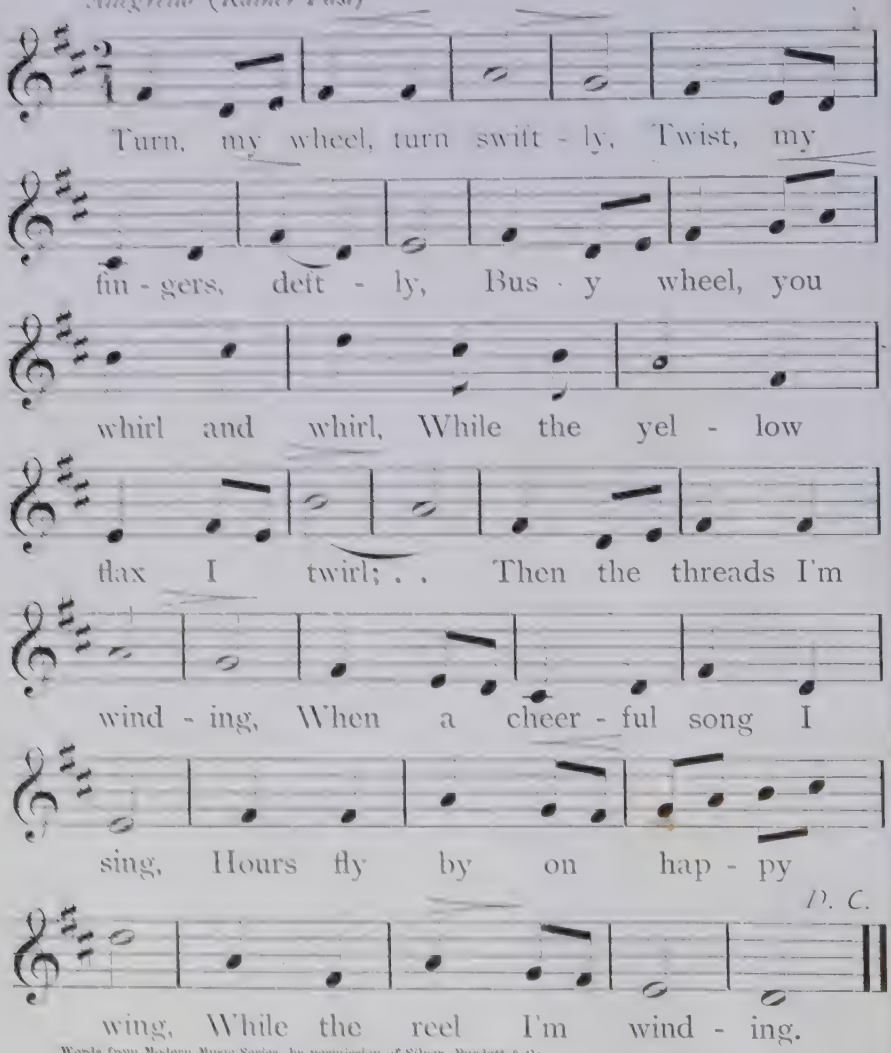
You have all heard of Egypt.
People there raised flax two thousand years ago.
The women spun and wove it into the finest of cloth.
Pieces of that cloth can be found in some places to-day.
Can you think of cloth two thousand years old?

SPINNING SONG

Eleanor Smith

Gerard Tonning

Allegretto (*Rather Fast*)



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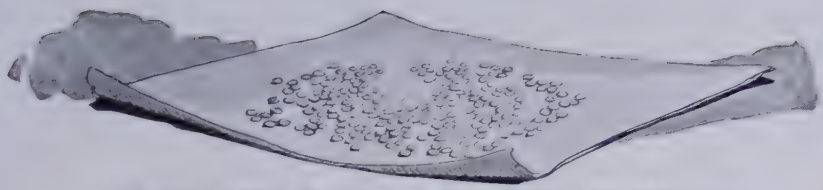
SILK

THE MULBERRY



THE EGGS FROM WHICH THE SILKWORMS ARE HATCHED

THE SILKWORM

See these tiny eggs.
At first they were glossy and yellow.
Now they are violet gray.
A moth laid them here last summer.
They have been sleeping all winter.
But now the days are getting warm.
All the world is awake and singing, "Come, little sleepers, wake up."
So the little sleepers awake, open their doors, and come out.
What do you think they are?
Little chestnut-brown worms!
Their heads are black and their bodies are covered with hairs.
Did you ever see such tiny caterpillars?

They creep about as if looking for something to eat.
If they could talk they would say, "If you do not feed us, we will spin no silk for you."
So we have gathered fresh young mulberry leaves and cut them into small pieces.
The little fellows smell the leaves and begin to eat.
They are very hungry.
We must feed them fresh mulberry leaves every two hours.
They eat most of the time, night and day.
Sometimes they rest just a little while.

MR. SILKWORM'S NEW COAT

First Age

Mr. Silkworm is just five days old.
When he was three days old his coat became darker.

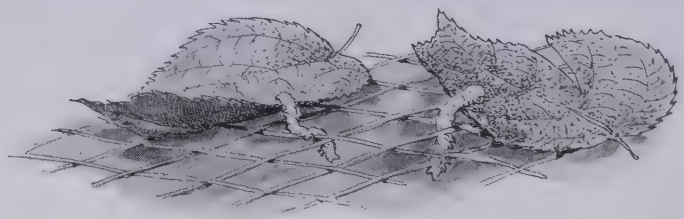
His head became almost white.
On the fourth day his body turned yellow.
To-day he is still paler.
What is the matter?
Is he ill?
He has eaten so much that his coat has become too small.
For the last two days his appetite has not been very good.
What shall we do?
Mother Nature says, "Never mind; I am making a new coat for him.

SILKWORMS IN THE FIRST AGE

"He must remain quiet more than a day."

See him toss his old cap off!
And sure enough, he has a new one under it!
Then he wriggles out of his old skin.

It takes him about a day and a half to change his coat.
His new coat is grayish in color.
This change of coats is called molting.



THE SILKWORMS SMELL THE LEAVES AND CRAWL THROUGH THE NETTING TO GET THEM

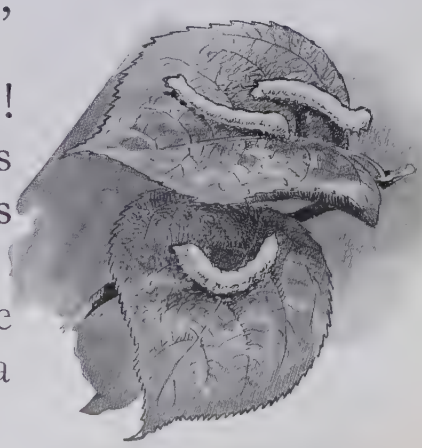
It makes him so tired that he does not eat much at first.
But in a little while he is as hungry as ever.
The silkworm's jaws do not move up and down as ours do.
They move from side to side.
Silkworms must have plenty of good, fresh air.
They like a clean house, too.
So we place a netting over them.
On the netting we put fresh-cut mulberry leaves.

They will smell the leaves and crawl through the netting to get them.
Then we must carry the worms to a new place.

ANOTHER NEW COAT

Second Age

Four days have passed since Mr. Silkworm changed his coat. Since then he has done nothing but eat, eat, eat.
How fast he is growing!
But this morning he is pale and again looks ill.
He wanders over the leaves, looking for a comfortable place.
His head is lifted.



SILKWORMS IN THE SECOND AGE

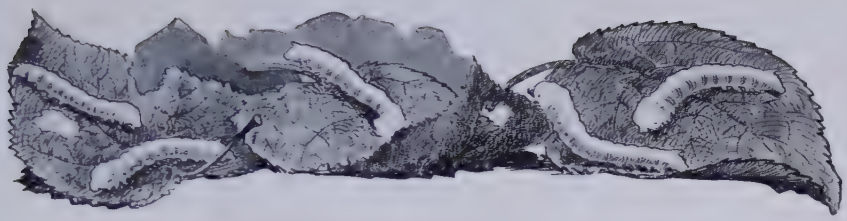
He is not hungry, for he does not eat.
Can you tell what he wants?

He is so fat he wants to change his coat again.
Yes, he is ready to molt a second time.
This time his coat is not gray, but chestnut-brown.
As before, it makes him tired to change his coat, so he rests a little while before he begins to eat.

THIRD MOLTING

Third Age

See how he grows!
In about five days more he will be ready to molt again.
Each time before molting he turns pale yellow.
He loses his appetite.
He wanders slowly over the leaves.
His head is raised as if looking about.
Each time after molting he is hungrier than the time before.



SILKWORMS IN THE THIRD AGE

The boys must bring larger quantities of mulberry leaves.

Now we may feed him whole leaves.

The girls must wipe the dust from them.

Dusty or dewy leaves are not good for silkworms.

THE LAST MOLT

Fourth Age

Mr. Silkworm is ready to molt for the last time.

It is about seven days since the third molting.

Now we may give him branches of leaves instead of whole leaves.

MR. SILKWORM IS READY TO MOLT FOR THE LAST TIME

He eats faster and more than he ever ate before.

He is like a greedy child.

He eats as if he were afraid some one would get more than he.

He must have more air and plenty of room.

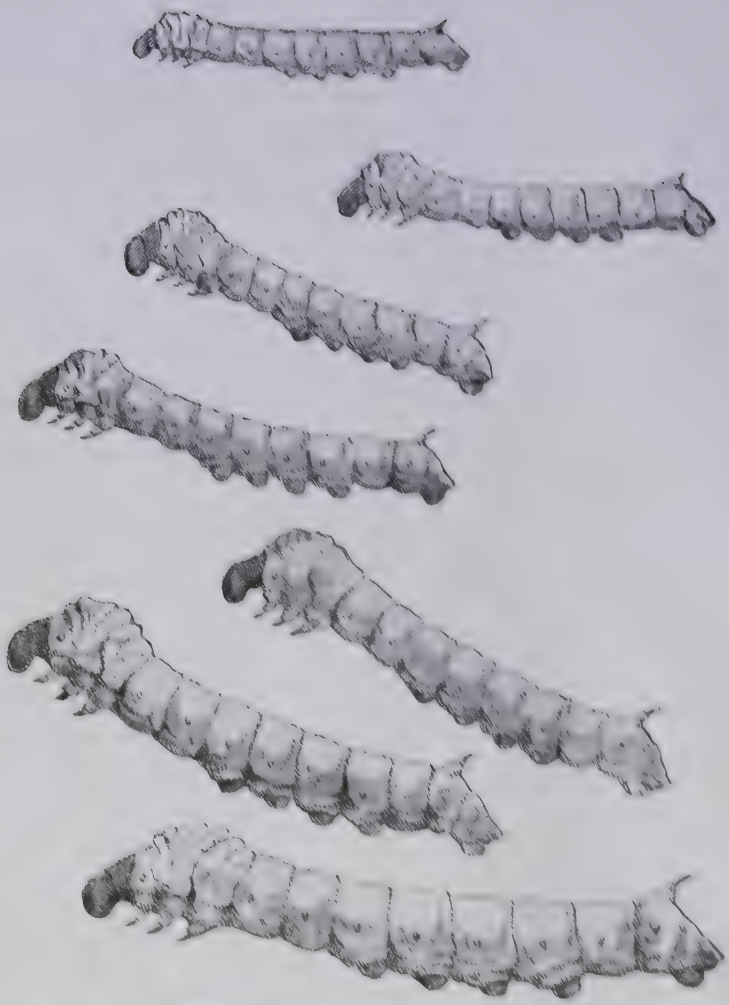
In about eight days more he will be a full-grown worm.

But he will not be a worm much longer.

MR. SILKWORM

Fifth Age

Let us look at this worm.
He has twelve rings around his body.
His head is covered with hard scales.
He can hear, but we cannot find his ears.
Sometimes he turns his head to one side.
We think he says, "What is it all about?"
There are six eyes on each side of his head, but he cannot see far.
These eyes are quite near his mouth.
Can you count his feet?
There are sixteen of them.
Ten are called false feet, and by and by he will lose them.
How does he breathe?
Through his nose?
No, indeed. He has no nose.
Do you see those little round dark spots on each side of his body?
Those spots are holes that lead to tubes.



SEVEN VIEWS OF MR. SILKWORM

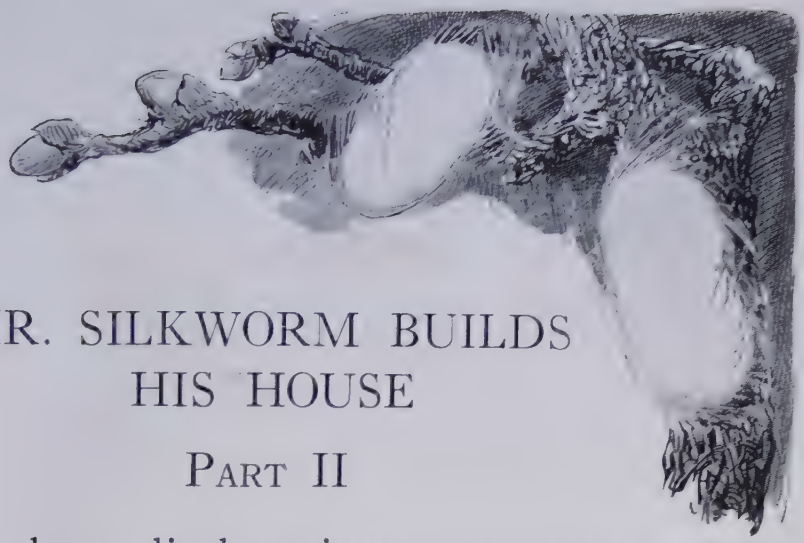
He breathes through these tubes.
Mr. Silkworm is now thirty-two days old.
He has grown fourteen thousand times bigger than he was at first.
Just think of that!
At last he has stopped eating.
He is growing restless now.
His head is turning waxy and yellow.
He is not so big, for his body has shrunk almost an inch.

MR. SILKWORM BUILDS HIS HOUSE

Part I

Mr. Silkworm is crawling about.
He is looking for something, and saying, "I want to build a house for myself.
"I must find a good place for it."
We put some small branches near for him to crawl up on.

But of what will he build his house?
Silk?
Yes, you are right.
In his body are two long glands.
These glands are like little sacks.
They are filled with silk.
While the silk is in the worm's body it is like jelly.
But when it is out in the air it becomes hard.
When the silkworm has found a place to suit him he will begin to spin.
He will throw out the silk thread from his spinneret.
The thread will be covered with gum.
The gum makes the thread stick together.
Let us watch the silkworm until he is out of sight.
It is time for him to form a net to hold his house.
His little house is called a cocoon.



MR. SILKWORM BUILDS HIS HOUSE

Part II

Oh, busy little spinner, are you
not tired?
Why do you spin your golden thread
so fast?
For more than two days you have not
rested a moment.
And why do you lay your golden thread
in the figure eight (∞)?
Your head moves sixty-nine times in a
minute.
Your web grows closer and thicker.
Now we cannot see you at all.

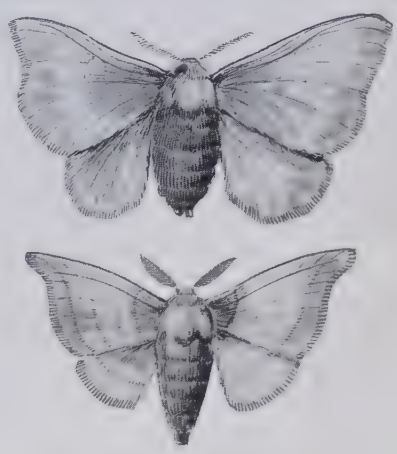
But your cocoon is not finished.
We can hear a soft, low sound.
You are still at work.
In about seven days more we shall not hear the sound.
Then we shall know that your house is finished.
You will be ready to take your long sleep.
Will you really sleep?
You are deceiving us.
We know you only seem to sleep.
Your body works all the time.
You will not be a worm any longer.
You will change into a golden chrysalis.

THE CHRYSALIS

THE CHRYSALIS

This is the chrysalis Mr. Silkworm has changed into.
What a queer looking thing!
We can see neither head nor feet.
After a long while the chrysalis will change into a creamy white moth.

THE MOTH



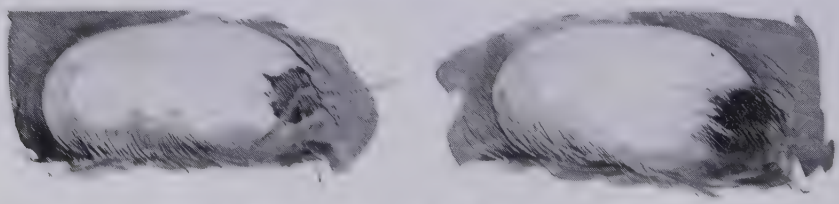
THE MOTH

Now the moths have come out of their golden houses.
They cannot fly far.
They do not eat, for they have no mouths.
The mother moth lays her eggs soon after she comes out of her cocoon.
She sometimes lays seven hundred eggs!

In a few days she will die.

When the moths come out of their cocoons they break the silk at one end.

This spoils the cocoon.



WHEN THE MOTHS COME OUT OF THEIR COCOONS THEY BREAK THE SILK AT ONE END

The silk raisers will not let all the moths come out.

Men put the cocoons in the hot sun or in steaming ovens.

The heat kills the chrysalis.

Then they put the cocoons in warm water to soften the gum.

The threads become loose and are then wound off on a reel.

This thread is called raw silk.

There are about twelve hundred yards of thread on one cocoon.

Sometimes there are more.
The skeins of raw silk are sent to the factories.
There they are made into shining cloth.

WHAT THE SILKWORM GIVES US

What beautiful cloth is made from silk!
Some of it is like a silver cloud, some like rippling water in the sunlight.
Here is a piece as fine as a spider's web, and as soft as down.
There is a piece that is strong, and rustles like the wind among the leaves.
And ribbons—how can I describe them?—with colors as beautiful as the rainbow!
Jane has a ribbon on her hair.
It has roses and green leaves woven in it.
Her sister is wearing one with little blue flowers in it.
Just think of the beautiful things that wonderful worm gives us!

MR. SILKWORM'S SECRET

Do you remember those tiny silkworm eggs?

What great things they held in store for us!

How hard that busy little brown worm did work!

He knew the mulberry leaves must be turned into silken thread.

Mother Nature knew it, too.

She knew just how many new coats he needed.

She knew that he must grow and be strong for the work he had to do.

Do you remember the soft, low sound inside the cocoon?

Mr. Silkworm was whispering the secret we have learned.

And every piece of silk whispers the same secret to all that know the story of the silkworm.

THE STORY OF YEP CHIN

Part I

The sun has just gone down behind the hills.

The last glow over the hilltops tells us that the end of the day has come.

Do you ever watch the sun go down?

Do you ever wonder where it has gone?

It has gone to wake up the boys and girls who live on the other side of the world.

They have day while we have night.

Our work is done when their work is just beginning.

Let us follow the sun and see what Yep Chin is doing this bright spring morning.

It is early, for the dew is still on the grass and trees.

Yep Chin has a basket of mulberry leaves on his arm.

BRINGING MULBERRY LEAVES FOR THE HUNGRY SILKWORMS

His little sister, Yen Goon, and his mother are with him.

Their baskets are full of mulberry leaves, too.

They have just come from the grove of low mulberry trees.

They are now at the door of a little bamboo house at one end of the grove.

After wiping the dew from the leaves Yen Goon and her mother cut some of them into pieces.

Yep Chin steps softly inside with the leaves and closes the door.

What do you suppose is in that little bamboo house?

Baby silkworms.

But all are not baby worms.

You may go inside the little house and see for yourself.

All around the rooms are trays standing on shelves.

The trays are covered with hungry worms.

Yep Chin feeds the black baby worms first.

To these he gives the finely cut leaves.

To others that are older he gives the larger pieces of leaves.

You can hear the hungry fellows eating rapidly.

The sound is like the patter of falling rain.

Yep Chin does not feed the big fellows that are at the end of the room.

They are pale and restless, and do not care to eat.

He knows that it is time for them to take their long sleep.

Two days ago Yen Goon and her mother put arches of twigs over them.

The worms will climb up on these twigs and spin their cocoons.

Yep Chin and Yen Goon have learned to love the silkworms.

Every morning Yen Goon carefully cleans the trays.

When the worms are to be fed she helps gather the mulberry leaves.

Then she wipes the dust and dew from them.

Let us look at these curious little people with yellow skin.

Their small, dark eyes are almond shaped and slanting.
Yep Chin's head is shaven, except a spot on top.
The hair on the crown of his head is allowed to grow.
It hangs down his back in a long braid.
See his loose coat and trousers, and his queer shoes!
All the men in China dress like this.
Yen Goon's hair is in tiny braids.
When she is a little older it will be put on the top of her head like her mother's.
Then, too, she will be old enough to help her mother unwind the cocoons.
When the cocoons are finished they will be unwound and the thread will be made into skeins.
The mother will weave some of the thread into cloth.
She will then take the cloth and the skeins that are left to market to sell.

Yep Chin's and Yen Goon's father is too poor to let his children wear clothes made of silk.
They wear cotton clothing.

Part II

Evening has come for Yep Chin and Yen Goon.
The sun is low, and the trees and houses make long shadows on the ground.
Yep Chin is sitting with his father on the door mat.
From where they are sitting they can see the big river flowing by.
On both sides are green hills and little farms.
Ships pass up and down the river.
Yep Chin is thinking about the ships, and he wonders where they are going.
His father tells him that they come from far-away lands.

YEP CHIN AND HIS FATHER WATCHING THE SHIPS PASS UP AND DOWN THE RIVER

"The people there do not dress or talk as we do," says his father.

"Where does the big white ship come from?" asks Yep Chin.

"That ship comes from a country called 'America.'

"When it sails away it will carry tea, rice, and silk

'It will take the silk your mother sold to-day," replies his father.

"Will the people in America weave the skeins into cloth as mother does?"

"No, they will be woven into cloth by big machines.

"When you are older I shall send you to America.

"You can earn more money there."

"Perhaps I can have a silk farm there just like yours!" exclaims Yep Chin.

"Yes," says his father, "and while you are out early in the morning gathering mulberry leaves Yen Goon will be sitting on this mat with me in the evening."

After many questions, Yep Chin falls asleep, and dreams of that far-away land, and of the boys and girls who live there.

It is morning for us now.

Yep Chin's and Yen Goon's work is finished for the day.

Our work has just begun.

THE EMPEROR TOLD HIS WIFE ABOUT THE NEED OF HIS PEOPLE

THE GODDESS OF THE SILKWORM

Long before Christ was born the people in China wore the skins of animals.

They did not know about the cotton, the wool, and the flax.

After many years animals became scarce in China.

People could not get skins for clothes.

One day the Emperor told his wife, Si Ling Chi, about this need of his people.

He asked her to find something from which clothes could be made.

She was a kind woman, and she wanted to do something for her people.

She thought and searched for many days.

One morning she took a walk in the beautiful palace garden.

There were mulberry trees in that garden, and Si Ling Chi had often seen little caterpillars on the leaves.

She had often seen them spin their cocoons. But she did not think much about them.

This morning she looked at the caterpillars a long time.

She went out every day to watch them spin the dainty thread.

By and by the cocoons were formed and she took one in her hands.

The loose threads floated about.

She pulled one of the threads and found she could unwind it from the cocoon.

THEY SOAKED A COCOON IN WATER AND FOUND THEY COULD UNWIND ALL THE THREAD

"I believe we could use this delicate thread," she said to herself.

She told others about it.

At first they could not unwind a long thread.

But the Chinese are a very patient people, and these women worked hard.

One day they soaked a cocoon in water and found that they could unwind all the thread.

It was more than three thousand feet long!
"Hoo-le-ma (See)!" said one.
"Ming, hing, haynung (Look, how beautiful)!" said another.
The silk was bright yellow.
"What can we do with it?" they asked each other.
They had never seen woven cloth.
They thought about it a long time.
At last they found a way to make cloth.
They put several threads together and twisted them to make stronger threads.
They wove them in and out, back and forth, into shining cloth.
How happy the people were!
They were so grateful to Si Ling Chi that they called her "The Goddess of the Silkworm."

The Chinese kept their secret hundreds of years.
They sold the raw silk to other countries.

The people in other countries could not find out how it was made.

Some time after Jesus was born some men went into China.

They went to teach the people about the Christ Child.

They were called monks.

One day when these monks were leaving China they put some silkworm eggs into the heads of their canes.

They took them to their own country.

The people soon learned how to care for the worms and unwind the cocoons.

They learned to weave their own thread into beautiful cloth.

Travelers carried the news to other lands.

In this way the secret was spread from one country to another.

Sometimes I hope that the Goddess of the Silkworm knows that she brought help to the people of other lands than her own.

THE STORY OF LITTLE TAKEKO

Part I

Takeko is a little Japanese girl.

She lives with her mother in a big city in Japan.

Her mother works in a large silk factory.

To-day Takeko is watching her weave silk thread into cloth.

When it is finished it will be dyed in beautiful colors.

In some factories the women weave into the cloth pictures of dragons, birds, and flowers.

This cloth is called art goods, and is sent to other countries.

The piece that Takeko's mother is weaving will be made into beautiful cloth to wear.

Some of the cloth will be shipped away and some will be made into kimonos for Japanese ladies.

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EVERY MORNING THEY TAKE THEIR BASKETS AND GATHER FRESH MULBERRY LEAVES FOR THE SILKWORMS

Takeko grows very tired watching her mother weave all day.

Last night when Takeko lay on her mat asleep she dreamed of the country.

She dreamed of the sunshine and of her cousins Hanako and Haruko, who live in the country.

Her mother had told her she could go to visit her cousins.

Part II

Let us go into the country with Takeko and see what she does there.

Her cousins are so glad to see her they want to show her everything at once.

They run on tiptoe to look into the back room of their house.

What do you suppose Takeko sees—beautiful silk?

Oh, no! She sees hundreds and hundreds of little baby worms.

Hanako and Haruko tell her the worms must be fed and tenderly cared for.

Then they get the baskets and take Takeko to the mulberry trees.

FEEDING THE SILKWORMS

Their mother is already there, getting leaves for the worms.

They fill all the baskets with little twigs and hurry back to the house.

There they prepare the leaves and show Takeko how to feed the little fellows.

They put the worms on clean trays and feed them every day.

PREPARING TO CHANGE THE SILKWORMS TO CLEAN BEDS

Each day as Takeko feeds fresh mulberry leaves to the worms, she sees how fast they grow.

Like Hanako and Haruko, she has learned to love them.

Takeko has been here nearly five weeks, and some of the worms are now full grown.

WEIGHING THE COCOONS AND REELING THE SILK

Some have stopped eating, and have crawled up on the sticks that were placed for them.

On these sticks Takeko watches the worms spin their wonderful golden houses.

The other worms are fed and cared for until they are old enough to begin to spin their cocoons.

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REELING SILK IN THE JAPANESE SILK FACTORY

Part III

When the cocoons are finished some are prepared and weighed for the factory.

Some are unwound and woven at home.

All these cocoons are called the second crop, because the worms are raised in the summer.

The silk Takeko's mother was weaving came from the spring crop.

The worms were raised in the spring, and their cocoons are very much better.

Only a few miles from Hanako's home there is a large reeling factory.

Takeko's mother has come there to work, and she has sent for her little girl.

In the factory Takeko will find her mother reeling raw silk into skeins to be sent to other countries.

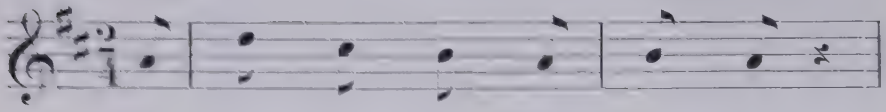
Most of this silk is shipped far away to America.

Just think, perhaps Takeko helped to raise the worms that made the silk in our beautiful ribbons!

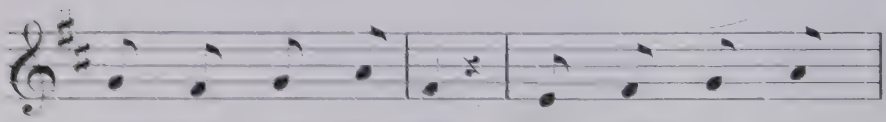
Who would think our pretty ribbons were once mulberry leaves?

TO THE SILKWORM

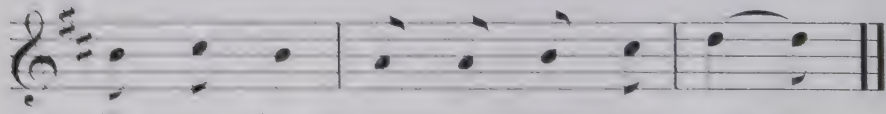
Emma V. Shoudy — Elnora E. Shillig



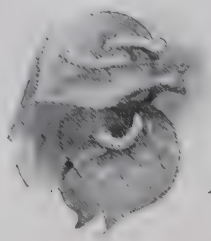
1. Oh, bus - y lit - tle spin - ner,
2. Oh, hap - py lit - tle spin - ner,
3. Oh, sleep - y lit - tle spin - ner,



Weav-ing now of gold, Pa - tient - ly the
In your co - zy nest, How we use your
You shall see full soon Gowns of silk and



silk - en thread, All so tight - ly rolled.
dain - ty thread, You have nev - er guessed.
rib - bons gay From your gold co - coon.



SUGGESTIONS TO TEACHERS

COTTON

Cotton Books. Let the children make books by fastening together sheets of suitable paper. In these books let them draw pictures of the cotton boll and cotton bale with charcoal or chalk.

Draw and color with water color or chalk a log cabin, cotton blossoms, and calico and gingham designs.

Make a poster of a plantation.

Make and paste in the books cuttings of plow, hoe, bags, baskets; cotton blossom, leaves, and boll; negro men and women carrying baskets on their heads.

Paste in the books samples of different kinds of cotton cloth.

Specimens of cotton in all the different stages may be obtained from cotton factories, and pasted in the books.

Sand-table Plantation. Let the children make log cabins of sticks. In the wet sand have them place small twigs in straight rows. Paste on these twigs cotton leaves and closed and open bolls made of plain dark green wall paper and cotton batting. The sand will be firmer if mixed with earth.

Pantomime. Have a row of children move to right or left, planting imaginary seeds, then hoeing, picking cotton, putting it into baskets, and carrying the baskets on their heads to their seats.

A SAND-TABLE PLANTATION

WOOL

Collections. Collect samples of wool and woolen cloth. Collect pictures of sheep, looms, and spinning wheels. Here is an excellent opportunity for the study of famous pictures of sheep.

Drawing and Cutting. Draw and cut pictures of sheep, a sheepfold, shepherd, crook, dog, spinning wheel, and of stockings, caps, dresses, and suits.

Dyeing. Dye samples of wool and woolen cloth.

Sand-table Landscape. Represent hills if possible, as most wool-growing sheep are raised in hilly or mountainous countries. Cover the hills with rocks and moss, or with green tissue paper cut fine to represent grass.

The children must be permitted to do everything possible to add interest, such as making fences, a sheepfold, hayrack, and cabin. As this subject is usually taken up at Christmas time, the five-cent sheep may be purchased at any department store.

LINEN

Collections and Observations. Collect samples of linen cloth and compare them with samples of cotton and woolen cloth.

Observe the different things made of linen—lace, handkerchiefs, clothing, table linen.

Sand Table. In the sand table, filled with rich earth, plant flax seeds and watch them grow. Pull up the stalks when ripe, tear them apart, and find the part from which the fiber is taken. Examine the fiber. Save some of the ripe stalks for the next spring's study.

A SAND-TABLE LANDSCAPE

Observations. Compare silk with cotton, wool, and linen. Distinguish one from the other by touch. Which is most beautiful? Why is silk so much admired?

Cocoons may be obtained from silk factories for a small sum. Put them into hot water and let the children find the main threads and unwind them. Watch the lay of the thread. Call attention to its fineness and strength. Observe how many times that thread is doubled to make one thread in the woven cloth.

Silkworms. Silkworm eggs may be obtained from the Department of Entomology in Washington, D.C. Raise the silkworm to maturity. Carefully watch him spin the first threads of his cocoon.

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